## CLAIMS

What is claimed is:

1. A transmission cable (200), for use in a magnetic resonance apparatus, the transmission cable comprising:

a plurality of cable segments (200n); and

a plurality of electroacoustic couplers (210) for providing electrical connection between segments.

2. A transmission cable as set forth in claim 1 further comprising:

a first mixer (311) disposed at a first end of the cable for shifting a signal frequency associated with the electroacoustic couplers.

3. A transmission cable as set forth in claim 2 further comprising:

a second mixer (321) disposed at a second end of the cable for shifting a signal frequency associated with the electroacoustic couplers.

4. A transmission cable as set forth in claim 1 wherein each cable segment comprises a first conductor (201) and a second conductor (202) and each of the first and second conductors is connected to at least one electroacoustic coupler.

5. A transmission cable as set forth in claim 1 wherein each electroacoustic coupler comprises:

a substrate (220);

a first set of conductive fingers (221) disposed on the substrate; and

a second set of conductive fingers (222) disposed on the substrate whereby an acoustic signal is passed from the first set of conductive fingers to the second set of conductive fingers.

6. An MR apparatus comprising:

a first magnet system (2) for generating a main magnetic field in an examination region (30);

an RF coil (10) disposed in the examination region for transmitting and/or receiving RF signals to and/or from the examination region; and

a plurality of transmission cables (200) for carrying signals with the MR system, at least one of the transmission cables comprising a plurality of cable segments and a plurality of electroacoustic couplers for coupling adjacent cable segments.

7. A MR apparatus as set forth in claim 6 wherein the at least one transmission cable further comprises a first mixer (311) disposed at a first end of the cable for shifting a signal frequency associated with the electroacoustic couplers.

8. A MR apparatus as set forth in claim 7 wherein the at least one transmission cable further comprises a second mixer (321) disposed at a second end of the cable for shifting a signal frequency associated with the electroacoustic couplers.

9. A MR apparatus as set forth in claim 6 wherein each cable segment comprises a first conductor (201) and a second conductor (202) and each of the first and second conductors is connected to at least one electroacoustic coupler.

10. A MR apparatus as set forth in claim 6 wherein each electroacoustic coupler comprises:

a substrate (220);

a first set of conductive fingers (221) disposed on the substrate; and

a second set of conductive fingers (222) disposed on the substrate whereby an acoustic signal is passed from the first set of conductive fingers to the second set of conductive fingers.

11. A transmission cable for use in a magnetic resonance apparatus, the transmission cable comprising:

a plurality of cable segments (200n); and

a plurality of couplers each of which transforms a first signal carried by a first cable segment into an acoustic signal and from the acoustic signal into a second signal carried by a second cable segment.

12. A transmission cable as set forth in claim 11 wherein each coupler has a high impedance for a common mode wave on the cable.

13. A transmission cable as set forth in claim 11, wherein the cable has a first end and a second end, wherein a mixer is disposed at each of the first and second ends for shifting a frequency of a signal transmitted by the cable.

14. An MR compatible catheter apparatus comprising:

a catheter;

a preamplifier; and

a transmission cable disposed between the catheter and the preamplifier, the transmission cable comprising a plurality of segments and a plurality of electroacoustic couplers for coupling signals between adjacent cable segments.